DOCUMENT RESUME

ED 241 046 IR 050 654

AUTHOR Griffiths, Jose-Marie; King, Donald W.
TITLE Multitype Library Networking: A Framework for Decision-Making.
PUB DATE Apr 83
NOTE 9p.; Paper presented at the National Online Meeting (4th, New York, NY, April 12-14, 1983).
PUB TYPE Viewpoints (120) -- Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Decision Making; *Library Administration; Library Automation; *Library Networks; *Library Planning; Library Services; Models; *Shared Services
IDENTIFIERS *Resource Sharing

ABSTRACT

This paper describes a decision making framework for library networking which can be used by individual libraries, groups of cooperating libraries, or centralized services to evaluate current operations and define alternative approaches to automation and networking. It is noted that networking has not yet achieved its full potential because of a lack of understanding of how networking can help individual organizations and because network structures have often been imposed upon organizations without regard to their economic considerations. Six interdependent dimensions of the decision making framework are outlined, including: (1) library operational, user related, and derived functions to be performed through cooperative activities; (2) types of access to resource sharing information (logical and physical); (3) types of materials handled; (4) services and products to be offered as an outcome of networking activities; (5) networking configurations or the relationships between the participants in the networking activity; and (6) the mode of communication between networking participants. A table listing library products and services related to each network function is presented, as well as an explanation of how to use the conceptual framework for decision making by utilizing the function dimension as a base dimension, selecting options for each of the remaining dimensions, and subjecting the options to a detailed economic analysis. (Author/ESR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Mary K. Yates

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED241046

IR050654

MULTITYPE LIBRARY NETWORKING: A FRAMEWORK FOR DECISION-MAKING

Jose-Marie Griffiths and Donald W. King, King Research, Inc.

Keywords: Library Networks, Library Networking, Evaluation, Cost-Benefit Analysis, Resource Sharing, Economics.

Abstract: Libraries and other information services are likely to be faced with continuing economic difficulties over the next decade. One of the most promising reliefs for them is networking and other forms of resource sharing. Unfortunately, networking has not yet achieved its full potential because of a lack of understanding of what networking is and how it can help individual organizations. Too often network structures have been imposed upon organizations without regard to their economic considerations or without their participation. In this paper we describe a framework for library networking which can be used for decision-making by individual libraries, groups of cooperating libraries or centralized services. The framework consists of six interdependent dimensions including: functions to be performed, type of access to information, types of materials handled, products and services to be offered, networking configurations and communications means. An economic model based on the framework can be used to determine the levels within each of these dimensions that should be accomplished by the individual libraries, groups of libraries or a centralized service.

1. INTRODUCTION

Library networking activities have evolved in several different shapes and forms since library administrators began to recognize the advantages that could accrue from cooperation. The objectives of interlibrary networking have been to provide access to more materials and/or services, and to either reduce costs to each participating library or to improve service at the same or lower cost than would be incurred by an individual library.

Two factors have, in the last decade, had a strong influence on both the growth of library networking and on the nature of the networking activities. These factors were a declining economy and developments in computing and communications technologies. Shrinking library budgets and increasing prices of materials have meant that libraries can no longer build comprehensive collections. Decisions relating to materials acquisitions have been made on usage statistics. Once libraries no longer locally store all of the materials requested by their patrons, interlibrary cooperation becomes a necessity to maintain the level of service expected by the patrons. Fortunately the technological advances in both computing and telecommunica-

tions and the evolution of online access to information systems have created a suitable support mechanism for interlibrary cooperation and networking.

There have been two evolving types of capabilities based on computing technologies (both hardware and software) and related communications technologies for libraries. They are:

- bibliographic services or utilities
- library automation systems.

Each of the two types has a role to play in changing library environments. Rather than compete, the two are mutually supportive and complementary, although the boundaries between them are blurring. The bibliographic services have traditionally supported shared cataloging and catalog production but have begun to move into other areas, such as acquisitions, serials control and interlibrary loan. The library automation systems supported the functions of circulation, catalog access and maintenance, serials control, acquisitions and management reporting. When first introduced into libraries, minicomputer-based systems were dedicated to a single function as a stand-alone (self-contained) system. Today, systems are being developed which combine many of the different functions. The systems of the future will be fully integrated systems. A truly integrated system implies that information to be stored is only input once even though it is used in many ways, and that system-wide functions such as monitoring, authorization control, indexing, sorting and searching are implemented only once.

The way in which librarians interact with the two types of capabilities is similar. In both cases, some form of computer terminal is used. This could be a dumb or intelligent terminal, or a microcomputer. Access to the bibliographic services (or network services) is always via remote telecommunications links (usually a telephone connection-dial up or dedicated), whereas access to a local integrated library automation system can be via a hard wire link direct to the computer as well.

The overlapping of these two types of capabilities, in terms of functions supported, requires that librarians must make decisions on how their functions would best be supported. The remainder of this paper outlines a framework which can be used to define alternative approaches to automation and networking, as well as to evaluate current operations. Finally, we discuss how the framework and corresponding analyses can be used to support decision-making and planning for automation and networking.

2. A CONCEPTUAL FRAMEWORK FOR LIBRARY NETWORKING

The literature describing library networking activities demonstrates a lack of consensus as to the components that comprise library networks. In our recently completed study of the feasibility of multitype library networking in the state of North Caroline (Ref. 1), we defined a unified conceptual framework that could be applied to the analysis (description, comparison, costing, etc.), planning, design, and evaluation of library networking activities. The framework has the following interdependent dimensions:

- functions to be performed
- type of access to information
- types of materials handled
- products and services to be offered
- networking configurations
- communication means.

These dimensions make up the first level of the framework and they each comprise several components. The dimensions, their components and their relationships are discussed below.

2.1 Functions to be Performed

The key dimension in considering library networking activities is the function that might be performed through cooperative activities. It is important to emphasize, at this point, that by networking activities we mean any type of cooperative activity that may, or may not, be supported by some form of technology. The functions that can be performed through library networking divide into three groups: those that relate to internal library operations, those that relate to patron services directly, and those that are derived from the first two types. Examples of these types of functions which could be achieved through networking activities are:

Library operational functions

- Acquisitions
- Cataloging
- Circulation recordkeeping
- Interlibrary loan request placement
- Staff training
- Referral to experts

User related functions

- Online bibliographic searching
- Catalog searching
- Reference
- Referral
- Document
- User training

Derived functions

- Online bibliographic searching
- Electronic mail

2.2 Type of Access to Information

The ability of cooperative networking to achieve these functions is dependent on two types of access to information: logical and physical. Logical access is provided through secondary information, such as the catalog or an index. Logical access to information can be provided at three different levels. The first level yields information about the *contents* of a collection. This information usually takes the form of a bibliographic record describing each item as in a catalog. The second level of logical access relates to the *location* of the item(s) sought. This is done by adding information about the holding institution to the item bibliographic record. The third level of logical access relates to the current *availability* of items. This can be achieved by linking the bibliographic information with circulation information to determine whether the required item is available in the holding library at the time, or

whether it is on loan or on reserve.

Physical access is access to the primary information itself. To a large extent, physical access is dependent on logical access. It might be argued that browsing is a form of physical access that can be achieved without logical access (although if browsing a shelf of books in a library, the logical access is provided through the classification order of the books). However, in most cases, physical access requires prior logical access.

2.3 Types of Materials Handled

This dimension is more or less self-explanatory and is concerned with the types of materials that are handled by the networking activities. The range of materials is fairly broad and includes monographs, serials, technical reports, state and federal documents, manuscripts, audiovisuals, records of various types (ILL requests, circulation transactions, etc.), equipment and machinery (such as film projectors, reading machines for the blind, etc.), and human resource expertise.

2.4 Services and Products to be Offered

The services and products that can be offered as an outcome of networking activities depend very much on the functions being performed and on the type of access that is permitted, and to a lesser extent on the types of materials handled. This is because often the same type of product or service covers several types of materials. Services refer to the activities conducted by the network in order to achieve certain functions. Products are the tangible results of the network services. The products and services relating to each of the functions identified previously are displayed below (see Table 1). It should be mentioned at this point that the services and products listed below are potential services and products that could be implemented. Even if all are desirable for libraries it would be necessary to prioritize them for implementation purposes, so that they can be phased into an overall networking activity.

2.5 Networking Configurations

This dimension refers to the relationships between the participants in the networking activity. It is the basis on which the communication links are established and implemented. For example, all the libraries in a state could communicate with each other through a central point such as the State Library, or all libraries located within a geographic region could communicate with each other, and with other regions through a central point such as a State Library.

Rather than impose a formal, rigid configuration on libraries (e.g., in a state), we prefer to describe networking configurations in terms of "zones of convenience" or ZOC's. A ZOC is defined as a library or group of libraries that can conveniently share resources. The convenience can arise from a variety of factors, including, but not limited to:

- geographic proximity
- similarities in types of patrons
- dissimilarities in collections
- existing cooperative relationships
- special relationships among libraries or librarians.

TABLE 1

LIBRARY OPERATING FUNCTIONS

Functions	Services	Products
Acquisitions	Ordering Receiving Funds transfer	Purchased item Acquisitions lists Statements of accounts
Document (or other item) Processing	Cataloging Labeling	Catalog records Labeled items
Circulation Record-Keeping	Patron registration Item check-in Item check-out Item reserves Overdue identification	Transaction records Patron lists Overdue notices
ILL Request Placement	ILL request placement	ILL request
Staff Training	Staff training	More trained personnel
Referral to Experts	Identification and location of experts	Lists or directories of experts

USER RELATED FUNCTIONS

Reference	On-line searching	Search outputs
	Catalog searching Reference Referral	Catalog information Request fulfillment
Physical Access	Document delivery	Requested item
User Training	User training	Trained users

DERIVED FUNCTIONS

Collection Development		Lists or directories of specialized collections Union lists
Communications	Electronic mail	Messages
Other	Word processing	Documents

Membership in one zone does not exclude membership in another. Membership can also change over time. We feel that this approach to configuration will allow libraries a sufficiently flexible way to establish networking without destroying or eroding existing cooperative practices which have been established over a period of time. The concept of a ZOC fits well into the current modes of operation but allows for future growth and expansion of networking activities.

The definitions of the ZOC's may well differ according to the networking functions to be performed. In other words, a library may belong to one ZOC because it performs one function, and to another because it performs a different function. Alternatively, ZOC's can provide different sets of products and services. Yet another important relationship is that between the types of access (logical and physical) and the ZOC's. The extent of coverage of the logical access data base (i.e., the secondary information used to identify, locate and determine availability of primary information) should be, at minimum, coverage of the holdings of the participants in a ZOC. The extent of coverage of physical access again should be at least that of the area containing all libraries participating in a ZOC. The logical access data base should have, at least, the same coverage as the physical access but can extend beyond. In other words, it is feasible that a logical access data base cover several ZOC's each defined by a convenient physical access mechanism. It is not unreasonable to consider the logical access data base to cover an entire state's library holdings and to have several ZOC's access it. On the other hand, one could equally well envisage a series of regional logical access data bases together covering statewide holdings, each with coincident ZOC's for physical access.

2.6 Communication Means

This dimension refers to the actual mode of communication between the networking participants. We wish to stress, once more, that networking does not necessarily imply some form of automation and telecommunications. We envisage a variety of communication means being utilized in library networking activities. Such means range over telephone (including WATS lines, MCI-type services, leased lines, etc.), TWX, existing telecommunications networks (such as TELENET and TYMNET), mail service, courier services and so on. The communications mechanism used will be determined, to a large extent, on the function being performed and on economic decisions made by the individual networking participants.

3. USING THE FRAMEWORK FOR DECISION-MAKING

The conceptual framework outlined above can be used to specify networking alternatives for libraries. The alternatives can be developed using the function dimension as the base dimension and selecting options for each of the remaining dimensions. The options might then be subjected to a detailed economic analysis.

In order to achieve the goal of preserving flexibility of networking activities, an economic analysis should be broken down by function. We feel it is essential to support management decision-making in individual libraries or library systems, as well as from an overall centralized viewpoint. To this end, a series of cost models describing discrete activities within functions have been developed (Ref. 1). For example:

Function: Cataloging
Activities: Pre-Catalog Searching
Original Cataloging
OCLC Record Update
Card Filing
Physical Processing

These activities can also be applied to the types of materials being handled:

- Monographs
- Serials
- Audiovisuals
- State Documents
- Other Materials.

Three types of costs are included in the cost models:

- Fixed one-time costs such as purchase of equipment, initial training, network initiation fees, etc.
- Fixed costs which recur on a regular basis such as equipment rental, line charges, annual training, etc.
- Variables costs associated with volume of activity such as total items cataloged, total items ordered, etc. Cost elements associated with variable costs include labor, equipment, supplies and communications.

The building of a bibliographic database of statewide or regional holdings to provide logical access to those materials might, for example, be considered the main priority. Economic analysis, therefore, would start with the cataloging function. The different options that could be considered include:

- manual cataloging
- use of a dedicated OCLC terminal in-house
- use of a dial-up terminal in-house
- sharing a dedicated OCLC terminal with other libraries
- sharing a dial-up terminal with other libraries
- using a centralized processing center.

Our evaluation results indicate the different breakdown points between one option and another in terms of cataloging volumes (e.g., above a certain number of items cataloged per year a library should acquire its own in-house OCLC terminal).

The next step in the evaluation is dependent on the outcome of the previous step. If a library decides that it should acquire an in-house terminal, then evaluation of options for the next function to be considered should maximize the use of the terminal that has been acquired (especially as the fixed costs of acquiring the terminal will have been taken into account with the previous cost analysis). Each additional function that is considered will be influenced by the previous set of decisions.

In the North Carolina study we demonstrated the use of the cost models by a hypothetical library cataloging a total of 25,000 items per year. At this level of activity and given the various costs we found in North Carolina (labor rates, rents, etc.) the hypothetical library could justify the acquisition of an in-house OCLC terminal for cataloging purposes.

The next step was to consider the other functions that could be supported by the OCLC terminal once installed. The candidate functions were:

- Interlibrary loan requesting
- Acquisitions

- Serials control.

We envisaged that libraries would eventually support their circulation activities and a public access online catalog on an integrated library automation system (ILAS). Such systems also support:

- Interlibrary loan request preparation
- Acquisitions
- Serials control.

After reviewing the costs of interlibrary loan request placement, it became clear that, where possible, the OCLC system should be used (i.e., if there is time available on the terminal).

The remaining decisions related to support of acquisitions and serials control via OCLC or the ILAS. The following possible situations can arise:

	OCLC Terminal	ILAS	Decision
Time Available	Yes	No	OCLC
	No	Yes	ILAS
	Yes	Yes	?

In the situation where either the OCLC terminal or the ILAS can be used, the appropriate action can be determined by the comparison of the variable cost elements only, as the fixed costs have been allocated to the primary functions (cataloging for OCLC and circulation control and online catalog searching for the ILAS).

It is clear that it is both important and possible to make automation and networking decisions that are based on identifiable cost alternatives. For all libraries there is a point at which the decision can be made as whether it is better to perform a function in-house or manually -- and beyond that point to participate in shared systems. The whole process, however, is a fragile one since relatively small changes in pricing strategy by the bibliographic utilities or system and service vendors can have serious and immediate repercussions on the decisions made by individual libraries.

4. REFERENCES

1. Griffiths, José-Marie, and King, Donald W. North Carolina Library Networking Feasibility Study. Report submitted to Division of State Library, North Carolina Department of Cultural Resources. August 1982. (Available from ERIC.)